

MISSOURI MONTHLY VITAL STATISTICS

Provisional Statistics

From The



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Focus. . .Risk Factors Improve, But Pregnancy Outcomes Do Not

Rates for many of the leading risk factors (i.e. inadequate prenatal care, adolescent births, and smoking during pregnancy) for poor pregnancy outcomes have improved over the past decade. However the low birth weight, very low birth weight and prematurity rates have gotten worse. Infant mortality dropped during the first half of the decade and has not improved since then. This apparent paradox in trends in perinatal statistics is explored in this article.

In the past ten years the rate of inadequate prenatal care decreased by 42 percent from 18.0 percent in 1989 to 10.5 percent in 1999. (See Table 1) Inadequate prenatal care is defined as fewer than five prenatal visits for pregnancies less than 37 weeks, fewer than eight visits for pregnancies or care beginning after the first four months of pregnancy. Numerous studies have shown that mothers with adequate prenatal care generally have better outcomes than those without adequate care, although the precise reasons are not clear.

Births to adolescent females peaked in 1992 at 4,147 and 5.5 percent of total births and have since decreased by 18 percent to 3,386 and 4.5 percent of births in 1999. Similarly the number of mothers with less than 12 years of education decreased from a high of 17,071 births in 1990 to 14,569 in 1999, a 15 percent decrease. With the improved economy, the number of mothers giving birth that were on food stamps decreased by 35 percent from a peak of 18,025 in 1992 to 11,679 in 1999.

Smoking during pregnancy, a risk factor strongly associated with low birth weight, also decreased in recent years. From 1989 to 1999, smoking rates decreased by 28 percent from 25.5 percent of births in 1989 to 18.3 percent. Another risk factor related to low birth weight, mothers at least 15 percent underweight for height before pregnancy, also decreased during the past ten years. From 1989 to 1999, births to these mothers decreased by 36 percent from 7,593 to 4,849.

Two risk factors that went against these positive trends are out-of-wedlock births and births to mothers aged 35 or more. The out-of-wedlock birth rate increased from 27.1 to 34.1 percent during the last ten years while the rate of births

to mothers aged 35 or more increased from 6.8 to 10.8 percent during the same time period.

Contrary to most of the positive trends in risk factors, the low birth weight (under 2500 grams) rate increased from 6.9 to 7.8 percent from 1989 to 1999, and the premature (<37 weeks gestation) rate increased from 9.1 to 10.3 percent during the same time period. (See Table 2.) The very low birth weight (VLBW, < 1500 grams) rate increased from 1.3 to 1.5 percent. The infant death rate decreased to a low of 7.4 per 1,000 live births in 1995, but has since increased slightly to 7.7 in 1999.

To further illustrate this paradox, we also examined trends in the number of risk factors by pregnancy outcome. Using the eight risk factors appearing in Table 1, approximately 42 percent of all births occurred to mothers with no risk factors in each of the four years studied (1989, 1994, 1998 and 1999). The percent of mothers with three or more risk factors decreased from 19.6 to 17.1 percent from 1989 to 1999, while the proportion of low birth weight births with three or more risk factors decreased from 35.7 percent to 28.8 percent during the same time period. These facts demonstrate that something else must be happening to affect the negative trends in outcomes.

Other factors that are influencing these trends as illustrated in Table 3 are the following:

- Multiple (twins, triplets, etc.) births have been increasing recently as a result of fertility drugs and increasing maternal age.
- More births are being delivered earlier by either C-section or induced labor.

During the past ten years multiple births increased by more than 25 percent from 1,825 in 1989 to 2,295 in 1999. Over half of all multiple births are born low birth weight. When multiple births were excluded, the increase in the low birth weight percentage during the last ten years was reduced by more than half from 13 percent to 5.5 percent. The VLBW increase was reduced from 18.6 percent to 8.4 percent.

Another factor affecting low birth weight and prematurity is the increasing tendency of physicians to deliver

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babies early by artificial means either by C-section or induced labor. Standard obstetrical practice has apparently changed as the survivability of low birth weight and VLBW infants has increasingly improved. Physicians are more likely to intervene and deliver the baby earlier in order to possibly prevent stillbirth and save the infant.

The overall C-section rate has not changed very much in the last ten years, but more premature and low birth weight births are being delivered by C-section. In 1989, 31 percent of premature deliveries and 36 percent of low birth weight births were done by C-section. By 1999, these percentages had increased to 34 percent and 39 percent, respectively. Over half (53.5 percent) of VLBW births are now being delivered by C-section compared with 49 percent in 1989.

Physicians are also increasingly using induced labor as a means of delivering births earlier than natural means, sometimes also to prevent a stillbirth. The induced labor rate more than doubled during the last ten years from 11 percent in 1989 to 23.9 percent in 1999. Similarly the rate of induced labor for low birth weight and premature deliveries also doubled. When both C-section and induced labor delivery are combined, over half (52 percent) of the low birth weight births and nearly half (47 percent) of the premature births in 1999 involved either C-section or induced labor. This compares with 42 and 36 percent, respectively in 1989.

With so many births being delivered prematurely partly

as the result of obstetrical procedures, the use of low birth weight or premature rates to measure the success or failure of the maternal and child health programs in the state becomes highly questionable. Multiple births and to a lesser extent C-sections are also increasing VLBW births. (Induced labor is seldom used for VLBW births.)

VLBW births have a major impact on infant mortality. While accounting for 1.5 percent of Missouri's 1999 live births, they represented half of all infant deaths. With VLBW births rising in the past few years one would expect infant mortality to also increase. However, infant mortality has remained fairly level because of improved survivability of VLBW infants due to medical advances. In 1999, nearly three-fourths of these small babies survived compared with two-thirds in 1989. The number of VLBW infants surviving the first year of life increased by nearly one-third from 1989 to 1999 from 658 to 867.

The improved survivability of VLBW infants further illustrates the complexity of the infant mortality issue. Several studies have shown that VLBW infants tend to have life long problems that range from neurosensory impairments such as blindness and deafness to neurodevelopmental problems including behavioral and learning disorders. They also tend to suffer from poor physical growth, recurrent infections and many hospitalizations. Preventing the factors which lead to VLBW infants is the greatest and most difficult challenge.

Table 1
Trends in Selected Risk Factors for Poor Pregnancy Outcomes: Missouri Resident Live Births 1989-1999

		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1989-99 Percent Change
Inadequate prenatal care	Number	13,603	13,847	13,627	12,561	11,589	9,737	8,786	8,577	8,155	8,111	7,676	-43.6%
	Percent	18.0	17.9	17.8	17.0	15.7	13.6	12.4	12.0	11.4	11.0	10.5	-41.7%
Unmarried mothers	Number	21,105	22,597	22,673	23,981	24,320	2,845	23,361	24,454	24,491	25,650	25,729	21.9%
	Percent	27.1	28.6	30.2	31.6	32.4	32.5	32.1	33.2	33.1	34.1	34.1	25.8%
Mother's education <12	Number	15,586	17,071	16,327	15,783	15,195	14,387	13,805	14,077	14,142	14,588	14,569	-6.5%
	Percent	20.0	21.6	20.8	20.8	20.2	19.6	19.0	19.1	19.1	19.4	19.3	-3.5%
Mother <18 years of age	Number	3,984	4,141	4,105	4,147	4,086	4,087	3,910	3,816	3,724	3,616	3,386	-15.0%
	Percent	5.1	5.2	5.2	5.5	5.4	5.6	5.4	5.2	5.0	4.8	4.5	-11.8%
Mother 35+ years of age	Number	5311	5739	6091	6073	6507	6686	7125	7526	7855	8153	8102	52.6%
	Percent	6.8	7.3	7.8	8	8.7	9.1	9.8	10.2	10.6	10.8	10.8	58.8%
Mother >15% underweight for ht	Number	7,593	7,354	7,401	6,744	6,098	5,801	5,519	5,404	5,063	4,971	4,849	-36.1%
	Percent	10.2	9.7	9.9	9.4	8.4	8.2	7.9	7.7	7.2	6.9	6.7	-34.3%
Mother smoking during preg.	Number	19,483	19,540	18,903	17,725	16,556	15,111	14,577	14,409	14,409	14,309	13,766	-29.3%
	Percent	25.5	24.7	24.1	23.3	22.0	20.6	20.0	19.5	19.5	19.0	18.3	-28.2%
Mother on Food Stamps	Number	13,473	15,524	17,875	18,025	17,773	16,500	15,567	15,146	13,625	12,005	11,679	-13.3%
	Percent	17.9	20.3	23.5	24.4	24.4	23.1	22.1	21.3	19.1	16.5	16.1	-10.1%

Table 2
Trends in Selected Pregnancy Outcomes: Missouri Residents 1989-1999

		1989-99											Percent Change
		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
Low birth weight (<2500 grams)	Number	5,389	5,630	5,884	5,579	5,639	5,557	5,547	5,537	5,721	5,896	5,844	8.4%
	Percent	6.9	7.1	7.5	7.3	7.5	7.6	7.6	7.5	7.7	7.8	7.8	13.0%
Very low birth weight (<1500 g.)	Number	981	950	1035	1008	993	954	950	951	1030	1066	1163	18.6%
	Percent	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.5	22.2%
Premature (<37 weeks gest.)	Number	7,112	7,383	7,668	7,667	7,404	7,265	7,060	7,451	7,212	7,640	7,771	9.3%
	Percent	9.1	9.3	9.8	10.1	9.9	9.9	9.7	10.1	9.8	10.2	10.3	13.2%
Infant Deaths	Number	767	746	798	647	630	597	539	558	562	573	581	-24.3%
	Rate*	9.9	9.4	10.2	8.5	8.4	8.1	7.4	7.6	7.6	7.6	7.7	-22.2%

*rate per 1,000 live births

Table 3
Trends in Selected Factors Influencing Pregnancy Outcomes: Missouri Resident Live Births 1989, 1994, 1998, 1999

		1989-99					Percent Change
		1989	1994	1998	1999		
Multiple Births	Number	1,825	2,005	2,234	2,295		25.8%
	Percent	2.3	2.7	3.0	3.0		30.4%
Multiple births that were LBW*	Number	982	1110	1286	1370		39.5%
	Percent	18.2	20.0	21.8	23.4		28.6%
Multiple births that were VLBW**	Number	193	222	254	309		60.1%
	Percent	19.7	23.3	23.8	26.6		35.0%
Induced labor	Number	8,518	15,093	18,011	18,766		120.3%
	Percent	11.0	20.6	23.9	24.9		126.4%
Induced labor on LBW* births	Number	452	886	1,006	953		110.8%
	Percent	8.4	15.9	17.1	16.3		94.0%
Induced labor on VLBW* births	Number	64	79	88	79		23.4%
	Percent	6.5	8.3	8.3	6.8		4.6%
C-Sections	Number	17,958	15,483	15,872	16,682		-7.1%
	Percent	23.1	21.1	21.1	22.1		-4.3%
C-Sections on LBW* Births	Number	1,948	1,980	2,234	2,288		17.5%
	Percent	36.1	35.6	37.9	39.2		8.6%
C-Sections on VLBW* Births	Number	481	467	573	622		29.3%
	Percent	49.0	49.0	53.8	53.5		9.2%

*low birth weight (<2500 grams) infants

**very low birth weight (<1500 grams) infants

Provisional Vital Statistics for September 2000

Live births decreased in September as 5,751 Missouri babies were born compared with 6,960 in September 1999. The birth rate decreased from 15.4 to 13.7 per 1,000 population for these monthly periods. Cumulative births for the 9- and 12-month periods ending with September, however, increased. For the first three-quarters of the year, births increased 2.1 percent from 56,772 to 57,974.

Deaths decreased in September and January - September as 3,701 Missourians died in September compared with 3,938 one year earlier.

The **Natural increase** in September was 2,050 (5,751 births

minus 3,701 deaths). With the increase in births and the decrease in deaths, the natural increase for the 9 months ending with September went up 7.1 percent from 15,572 to 16,880.

Marriages increased for all three time periods shown in the table below.

Dissolutions of marriage also increased for all three time periods shown below.

Infant deaths decreased in September as 40 Missouri infants died compared with 53 one year earlier. For the 9 months ending with September the infant death rate decreased slightly from 7.5 to 7.4 per 1,000 live births.

PROVISIONAL VITAL STATISTICS FOR SEPTEMBER 2000

Item	September				Jan.-Sep. cumulative				12 months ending with September				
	Number		Rate*		Number		Rate*		Number		Rate*		
	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000	1998	1999	2000
Live Births	6,960	5,751	15.4	13.7	56,772	57,974	13.8	14.2	76,436	76,960	13.7	14.0	14.0
Deaths	3,938	3,701	8.7	8.8	41,200	41,094	10.0	10.0	54,464	54,849	9.9	10.0	10.0
Natural increase...	3,022	2,050	6.7	4.9	15,572	16,880	3.8	4.1	21,972	22,111	3.8	4.0	4.0
Marriages	4,510	4,955	10.0	11.8	33,916	34,380	8.3	8.4	43,929	44,833	8.0	8.0	8.2
Dissolutions	2,032	2,334	4.5	5.6	18,344	19,970	4.5	4.9	24,620	26,209	4.7	4.5	4.7
Infant deaths	53	40	7.6	7.0	428	427	7.5	7.4	565	587	8.1	7.4	7.6
Population base (in thousands)	...	...	5,468	5,500	...	...	5,468	5,500	...	...	5,431	5,462	5,492

* Rates for live births, deaths, natural increase, marriages and dissolutions are computed on the number per 1000 estimated population. The infant death rate is based on the number of infant deaths per 1000 live births. Rates are adjusted to account for varying lengths of monthly reporting periods.

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